UCSI UNIVERSITY

B.ENG. (HONS) IN MECHATRONIC ENGINEERING

COURSE OUTLINE

Subject name	Engineering Fundamentals
Subject code	EE104
Status	Minor
Credit hour	2
Semester/Year	1/1
Pre-requisite	Nil
Teaching method	Lecture
Assessment	Test 10% Mid-Term 20% Assignments 10% Project Presentation 10% Final Exam 50% The course has four assessment components as described above. ***Tests***: Test will be conducted on week 4-5 of the semester. ***Midterm*** exam: will be conducted on week 8-9 of the semester. ***Assignment*****:** Assignment will be given throughout the semester that will focus on learning outcomes related to knowledge & understanding, practical and intellectual skills. It is compulsory to submit all assignments; failing to do so will result in complete failure in the subject. Project Presentation: Projects will be given to all students at the beginning of the semester and projects can be either on group or individual basis. Students are required to submit the project findings and do the project presentation in the class. ***Final Exam*** component: 2 hours duration. 40% ruling: Applicable Supplementary exam: Applicable (on the final exam only)
Lecturer	Mr. Thair
Objective	This unit aims to: 1. Introduce to students the careers in engineering and available options in the various fields of engineering. 2. Introduce to students the basic knowledge and needs of engineering problem solving and presentations. 3. Provide students with a fundamental understanding of how engineers function in today's progressing world. 4. Introduce to students professional ethics and role of professional bodies 5. Introduce to students to risk management and sustainability 6. Develop students' skills in solving open-ended problems. 7. Motivate students to continue their engineering education.
Learning Outcomes	Upon completion of this module, the student will be able to: 1. Understand the engineering profession as well as the interaction between various engineering disciplines. 2. Understand the importance of being competitive in the international marketplace and how to use teaming and problem-solving skills to achieve a high level of competitiveness. 3. Understand the need for developing their technical and non-technical abilities in their chosen discipline.

	4. Understand role of professional bodies and their importance for professional ethics and code of practice. 5. Understand the importance of sustainability, product liability and management of risk. 6. Understand the procedure for approaching an engineering design and problem solving, determining the necessary data and method of solution, and presenting the results. 7. Understand the engineering estimation and the use of dimensions and units. 8. Enhance the ability to use software applications such as Matlab for the analysis and presentation of engineering data.			
Syllabus & Contact hour		**Lecture**	**Tutorial**	**Lab**
	1. Engineering – Definition; the technology team; functions of the engineer; the engineering disciplines; total quality in engineering; education of the engineer; professionalism and code of ethics; professional and technical organizations; professional development; role and responsibilities of the engineer in today's world, Engineering education and professionalism; challenges of the future.	8		
	2. Engineering Ethics (a case study approach), Ring ceremony.	2		
	3. Sustainability; social implications of technology, environmental impact of technology.	3 2		
	4. Engineering academic programmes – Selection of a programme; a Malaysian overview; where students end up; relationship between institution and industry.	3		
	5. Design as a part of Engineering – Definition of design; an approach to design; reflections on the process; design vs analysis; dealing with uncertainty; failure and safety; management of risk and product liability.	2		
	6. Engineering Solutions – Problem analysis; the engineering method; problem presentation; standards of problem presentation.	2 2		
	7. Representation of Technical Information – Collecting and recording data; general graphing procedures; empirical functions; curve fitting; method of selected points; empirical equations – linear and exponential curves.	2 2		
	8. Engineering Estimations and Approximations – Significant digits; accuracy and precision; errors; approximations. 9. Preparation for Computer Solutions – Introduction to engineering software; Matlab, Pspice			

Total hour		**28**		
Textbook	ENGINEERING FUNDAMENTALS AND PROBLEM SOLVING, 4TH ED., by Arvid, Eide, Roland Jenison, Lane Mashaw, and Larry Northup. McGraw Hill			
Reference	FOUNDATION OF ENGINEERING, 3RD ED., by Mark T.Holtzapple, W.Dan Reece. McGraw Hill FUNDAMENTALS OF ENGINEERING DESIGN, 2nd ED., by Barry Hyman, Prentice Hall, 2002. ENGINEERING ETHICS, AND THE ENVIRONMENT, by P.A.Vesilind, A.S.Gunn, Cambridge University Press.			
Lab session (if any)	Nil			

Matrix CO/PO

	Knowledge & Understanding								Intellectual Skills				Practical Skills						Transferable Skills			
	1	2	3	4	5	6	7	8	1	2	3	4	1	2	3	4	5	6	1	2	3	4
CO/ PO	B	A		C			B	C				B				C						

A: strongly related
B: Moderately
C: Slightly